Aristolochia longlinensis (Aristolochiaceae), a New Species from Western Guangxi, China

Lei Wu

Guangxi Institute of Botany, Guangxi Zhuangzu Autonomous Region, and the Chinese Academy of Sciences, Guilin, CN-541006, People's Republic of China; College of Life Sciences, Beijing Normal University, Beijing 100875, People's Republic of China. wuleiibk@163.com

*Wei-Bin Xu, Yu-Song Huang, and Yan Liu**

Guangxi Institute of Botany, Guangxi Zhuangzu Autonomous Region, and the Chinese Academy of Sciences, Guilin, 541006, People's Republic of China.

*Author for correspondence: gxibly@163.com

ABSTRACT. *Aristolochia longlinensis* Yan Liu & L. Wu, a new species from western Guangxi, China, is described and illustrated here. It is morphologically most similar to *A. cucurbitoides* C. F. Liang, with which it has been taxonomically confused in the past. However, the new species can be easily distinguished from the latter by the trumpet shape of its flower limb (vs. cylindrical shape in *A. cucurbitoides*), ca. 1.8 cm in diameter at the mouth (vs. 2–3 mm), lobes widely deltoid (vs. lanceolate), ca. 5 × 20–25 mm (vs. 5–7 × 2–3 mm).

Key words: *Aristolochia*, Aristolochiaceae, China, Guangxi, IUCN Red List.

Aristolochia L., with approximately 400 species, is the largest genus in the family Aristolochiaceae (Huang et al., 2003, 2013; Xu et al., 2011; Wu et al., 2013). The genus has its main center of diversity in tropical America while the Hengduan mountainous region in China is the secondary one (Ma, 1989). Following the classifications of Duchartre (1854, 1864) and Schmidt (1935), the genus is divided into three subgenera on the basis of the morphological characters of the gynostemium, anthers, and capsule. *Aristolochia* subg. *Siphisia* (Raf.) Duch. is further divided into three sections, namely, *Aristolochia* sect. *Asterolytes* (Duch.) Duch., *Aristolochia* sect. *Hexodon* Duch., and *Aristolochia* sect. *Siphisia* (Raf.) Duch. *Aristolochia* subg. *Aristolochia* is similarly partitioned as *Aristolochia* sect. *Aristolochia*, *Aristolochia* sect. *Diplolobus* (Duch.) Duch., and *Aristolochia* sect. *Gymnolobus* (Duch.) Duch. The third subgenus is *Aristolochia* subg. *Pararistolochia* (Hutch. & Dalziel) O. C. Schmidt. The classifications of Duchartre (1854, 1864) and Schmidt (1935) have been broadly accepted (Ma, 1989), in contrast to other treatments by Klotzsch (1859) and Huber (1960, 1985), who divide the genus into several small genera. Ma (1989) has revised the classification scheme based on *Aristolochia* species from eastern and southern Asia, which corresponds with the taxonomic perspectives of Duchartre and Schmidt. Further, González (1999) asserts that inflorescence morphology is taxonomically relevant at the infrageneric level.

According to Huang et al. (2003), there are ca. 45 species of *Aristolochia* in China, of which ca. 33 are endemic to the country. The name *A. wuana* Zhen W. Liu & Y. F. Deng (Liu & Deng, 2009) was proposed to replace the superfluous name *A. macrocarpa* C. Y. Wu & S. K. Wu ex D. D. Tao, which was blocked by the earlier name *A. macrocarpa* Duch. This new name, however, does not appear in the recent treatment of *Aristolochia* in volume 5 of the *Flora of China* (Huang et al., 2003). Additional species include four new species of *Aristolochia*: two from Hainan Island, China (Xu et al., 2011), and two from Guangxi, China (Huang et al., 2013; Wu et al., 2013), which have been recently described and illustrated. Thus, to date, there are ca. 50 named species of *Aristolochia* in China.

In 1975, a novel species of *Aristolochia* was described as *A. cucurbitoides* C. F. Liang, based on a specimen collected from Tianlin County, Guangxi, China (Liang, 1975). However, the flower of the specimen was not fully developed, and therefore the flower was described as a calyx having three lobes that were lanceolate based on another specimen collected from Yangbi County, Yunnan, China (Cheng et al., 1988). During a study of *Aristolochia*, a striking new species morphologically similar to *A. cucurbitoides* was found and is described here. Its flowers are distinctive in both living and herbarium specimens, but its leaves have been confused with the latter species.

Figure 1. *Aristolochia longlinensis* Yan Liu & L. Wu.—A. Fertile habit.—B. Lateral view of flower.—C. Flower from front view. Photos taken of the paratype *Yan Liu L0753* (IBK) at the type locality in Longlin County.

Aristolochia longlinensis Yan Liu & L. Wu, sp. nov. TYPE: China. Guangxi: Longlin County, Longhuo Township, Diyan Village, 24°34′N, 105°35′E, 1 200 m, 7 July 1991, *H.-Q. Wen 00314* (holotype, IBK; isotype, PE). Figures 1, 2.

Haec species *Aristolochiae cucurbitoidi* C. F. Liang affinis, sed ab ea limbo calycis tubaeformi (vs. cylindraceo) ad orem ca. 1.8 cm diam. (vs. 2–3 mm), lobis calycis late deltoideis apice acutis ca. 5 × 20–25 mm (vs. lanceolatis apice acuminatis, 5–7 × 2–3 mm) differt.

Herbs twining; stems terete, sparsely yellow-brown pubescent. Petioles 2–8 cm, sparsely villous; leaf blades trullate-lanceolate, ovate-lanceolate, or lanceolate, 12–20 × 4–6.5 cm, papery, both blade surfaces sparsely pubescent or abaxially glabrescent; veins palmate, in 5 or 6 pairs from base; blade bases auriculate, with a sinus 1.5–2.5 cm deep, blade apex

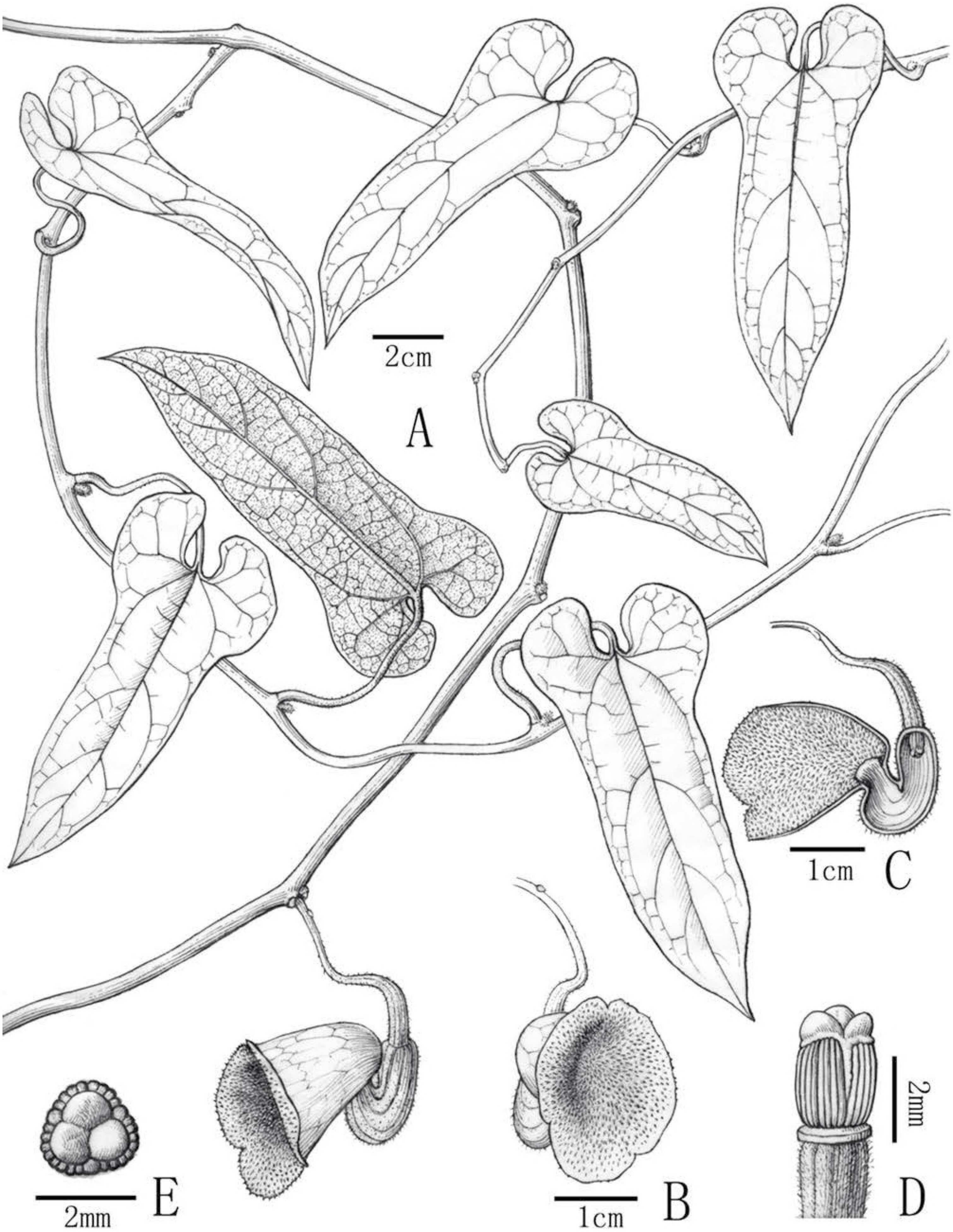

Figure 2. *Aristolochia longlinensis* Yan Liu & L. Wu.—A. Fertile habit.—B. Flower from front view.—C. Longitudinal section through the flower, showing the internal structure.—D. Anthers and gynostemium.—E. Gynostemium, view from above. Drawn by S. Q. He from the paratype *Yan Liu L0753* (IBK).

long acuminate. Flowers axillary, solitary; pedicels pendulous, 3–4.5 cm, sparsely pubescent; bracteoles ovate, ca. 3 × 2 mm, densely brown villous, inserted near the base of peduncle. Calyx yellowish green, limb purple; tube geniculately curved, externally yellowish green, internally purple, abaxially sparsely villous; basal portion of tube ca. 20 × 8 mm; limb trumpet-shaped, densely papillate on the inner surface, ca. 2 cm long, ca. 1.8 cm in diam. at the mouth, lobes 3, nearly equal, widely deltoid, apex acute, ca. 5 × 20–25 mm; anthers oblong, ca. 2 mm; gynostemium 3-lobed. Capsules not seen.

Habitat and distribution. *Aristolochia longlinensis* is known only from Longlin County in Guangxi Province. It was collected under open forest domi-

nated by Lauraceae, Fagaceae, Theaceae, and Betulaceae at altitudes from 1150 to 1250 m.

IUCN Red List category. At present, there are only seven known populations with fewer than five surviving individuals in each population. In addition, during our fieldwork, we found that farmland and eucalyptus forests were expanding in this area, which would of course result in deforestation and habitat loss for this species. This species is therefore assigned a status of Endangered [EN A1abcd + C2a(1)], according to IUCN Red List criteria (2001).

Phenology. *Aristolocia longlinensis* has been collected in flower from April to May. No fruiting specimens have been seen.

Etymology. The specific epithet is derived from the type locality of Longlin County, in Guangxi Province in southern China.

Discussion. The plant *Aristolochia longlinensis* has been collected previously, but the specimens were mistakenly identified as *A. cucurbitoides*, including a collection by Qi-Bin Huang from Longlin County in 1973 (Liang, 1975). The plant was not recognized as being different from *A. cucurbitoides* until the authors did fieldwork in Longlin County, photographing its flowers in 2003 (Fig. 2).

According to Ma's (1989) classification, *Aristolochia longlinensis* and *A. cucurbitoides* both belong to *Aristolochia* subg. *Siphisia* on the basis of the 3-lobed gynostemiums and oblong anthers that are adnate in pairs opposite the gynostemium lobes. However, *A. cucurbitoides* belongs to *Aristolochia* sect. *Pentodon* Klotzsch, based on the cylindric calyx limb, and *A. longlinensis* belongs to *Aristolochia* sect. *Nepenthesia* Klotzsch, based on the obliquely trumpet-shaped calyx limb.

Aristolochia longlinensis and *A. cucurbitoides* are most similar to one another. Shared characters include the twining, herbaceous stems that are not woody, the similar leaf shape, and the single-flowered inflorescences. However, *A. longlinensis* can be distinguished from *A. cucurbitoides* by its trumpet-shaped limb (vs. cylindrical), ca. 1.8 cm diameter at the mouth (vs. 2–3 mm), lobes widely deltoid and apex acute (vs. lanceolate and acuminate), ca. 5 × 20–25 mm (vs. 5–7 × 2–3 mm).

Paratypes. CHINA. **Guangxi:** Longlin County, Longhuo Township, under open forest, Sep. 1973, *Q.-B. Huang 10116* (IBK); 5 Apr. 2003, *Y. Liu L0753* (IBK).

Acknowledgments. The authors are grateful to Prof. Jinshan Ma (Shanghai Chenshan Plant Science Research Center, Chinese Academy of Sciences) for useful comments, to Dr. Qiang Zhang (IBK) for improving the English, and to Mr. Shunqing He (IBK) for the illustration. This study was supported by the Guangxi Natural Science Foundation, grant no. 010104 to Yan Liu, and the Knowledge Innovation Program of the Chinese Academy of Sciences, grant no. KSCX2-YW-Z-0912, to Yan Liu.

Literature Cited

Cheng, C. Y., C. S. Yang & S. M. Hwang. 1988. Aristolochiaceae. Pp. 159–245 *in* H. S. Kiu & Y. R. Ling (editors), Flora Republicae Popularis Sinicae, Vol. 24. Science Press, Beijing.

Duchartre, P. 1854. Tentamen Methodicae Divisionis Generis *Aristolochia*. Ann. Sci. Nat., Bot. sér. 4, 2: 29.

Duchartre, P. 1864. Aristolochiaceae. P. 421 *in* A. P. de Candolle (editor), Prodromus Systematis Naturalis Regni Vegetabilis, Vol. 15, Pt. 1: 421–498. Treuttel et Würtz, Paris.

González F. 1999. Inflorescence morphology and the systematics of Aristolochiaceae. Syst. & Geogr. Pl. 68: 159–172.

Huang, S. M., L. M. Kelly & M. G. Gilbert. 2003. Aristolochiaceae. Pp. 246–269 *in* C. Y. Wu & P. H. Raven (editors), Flora of China, Vol. 5. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.

Huang, Y. S., R. C. Peng, W. N. Tan, G. F. Wei & Y. Liu. 2013. *Aristolochia mulunensis* (Aristolochiaceae), a new species from limestone areas in Guangxi, China. Ann. Bot. Fenn. 50(3): 175–178.

Huber, H. 1960. Zur Abgrenzung der Gattung *Aristolochia* L. Mitt. Bot. Staatssamml. München 3: 531.

Huber, H. 1985. Samenmerkmale und Gliederung der Aristolochiaceen. Bot. Jahrb. Syst. 107: 277.

IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

Klotzsch, T. 1859. Die Aristolochiaceae des Berliner Herbariums. Monatsber. Konigl. Preuss. Akad. Wiss. Berlin: 1–571.

Liang, C. F. 1975. The Aristolochiaceae of Kwangsi Flora. Acta Phytotax. Sin. 13(2): 10–18.

Liu, Z. W. & Y. F. Deng. 2009. *Aristolochia wuana*, a new name in Chinese *Aristolochia* (Aristolochiaceae). Novon 19: 370–371.

Ma, J. S. 1989. A revision of *Aristolochia* Linn. from E. & S. Asia. Acta Phytotax. Sin. 27(5): 321–364.

Schmidt, O. C. 1935. Aristolochiaceae. P. 204 *in* A. Engler & K. Prantl (editors), Die natürlichen Pflanzenfamilien, Vol. 16b, 2nd ed. W. Engelmann, Leipzig.

Wu, L., W. B. Xu, G. F. Wei & L. Liu. 2013. *Aristolochia huanjiangensis* (Aristolochiaceae), a new species from Guangxi, China. Ann. Bot. Fenn. 50(6): 413–416.

Xu, H., Y. D. Li, H. J. Yang & H. Q Chen. 2011. Two new species of *Aristolochia* (Aristolochiaceae) from Hainan Island, China. Novon 21: 285–289.